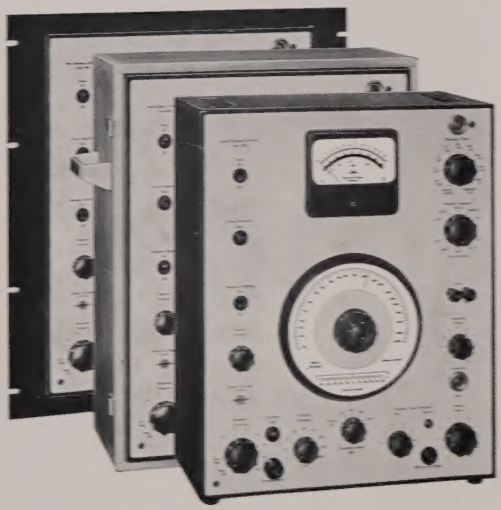
Mechanical

ASSEMBLY MANUAL

FOR BRÜEL & KJÆR INSTRUMENTS



C B A

- Accelerometers
- Acoustic Standing Wave Apparatus
- Artificial Ears
- Artificial Voices
- Audio Frequency Response Tracers
- Audio Frequency Spectrometers
- Audio Frequency Vacuum-Tube Voltmeters
- Automatic A.F. Response and Spectrum Recorders
- Automatic Vibration-Exciter Control Generators
- Band-Pass Filter Sets
- Beat Frequency Oscillators
- Complex Modulus Apparatus
- Condenser Microphones
- Deviation Bridges
- Distortion Measuring Bridges
- Frequency Analyzers
- Frequency Measuring Bridges
- Hearing Aid Test Apparatus
- Heterodyne Voltmeters
- Level Recorders
- Megohmmeters
- Microphone Accessories
- Microphone Amplifiers
- Microphone Calibration Apparatus
- Mobile Laboratories
- Noise Generators
- Noise Limit Indicators
- Pistonphones
- Polar Diagram Recorders
- Preamplifiers
- Precision Sound Level Meters
- Recording Paper
- Strain Gage Apparatus and Accessories
- Surface Roughness Meters
- Variable Frequency Rejection Filters
- VHF-Converters
- Vibration Pick-ups
- Vibration Pick-up Preamplifiers
- Wide Range Vacuum Tube Voltmeters

BRÜEL & KJÆR
NÆRUM, DENMARK. Teleph.: 80 05 00. Cable: BRUKJA. Telex: 5316. COPENHAGEN

BB 3500 - 0300060

Cabinet Assembly

Most B & K instruments can be delivered in three different versions, and the user can therefore, to his individual choice, order just that configuration, which is convenient to his use.

The mechanical design of most B & K apparatus is such that the instruments, which are delivered in lightweight metal cases (Type A) as a standard fitting, can very easily be mounted in any of three ways, i.e.:

Mahogany cabinet (Type B), frame for 19″ standard rack (Type C), or B & K combination mounting unit.

The four plugs mounted on the top of the metal case (Type A), act as buffers, when another instrument is placed upon it, and these four rubber plugs are in alignment with the rubber feet of the other instrument.

When a Type A instrument is changed to Type B, Type C or used in a B & K combination mounting unit, the four rubber plugs must be removed.

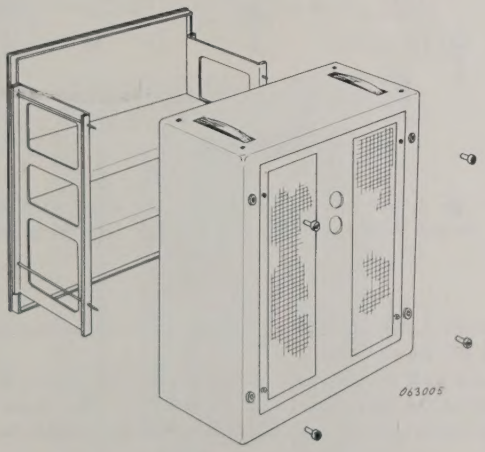


Fig. 1.

Type A.
These instruments are housed in metal cases and are intended for laboratory use (stationary use).

If it should be necessary to take these instruments out of their metal cases, this can be carried out very easily.
By removing the four threaded retainers located at the back of the equipment it is possible to pull the instrument out (see Fig. 1).

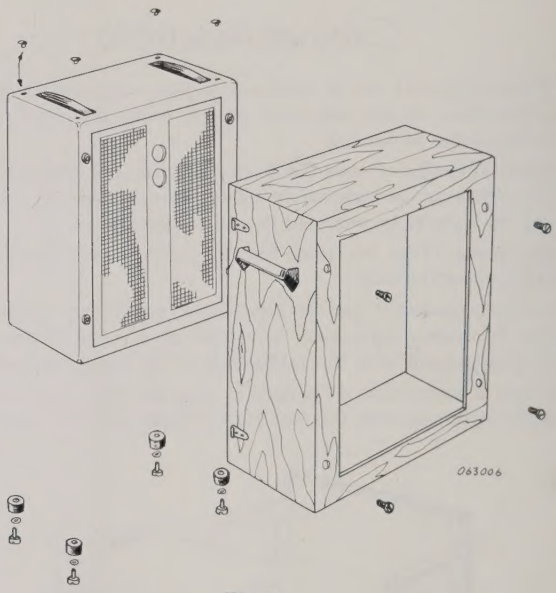
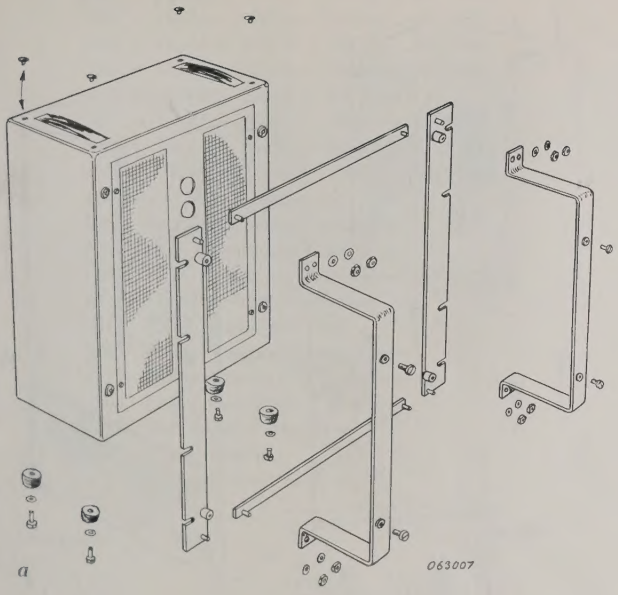


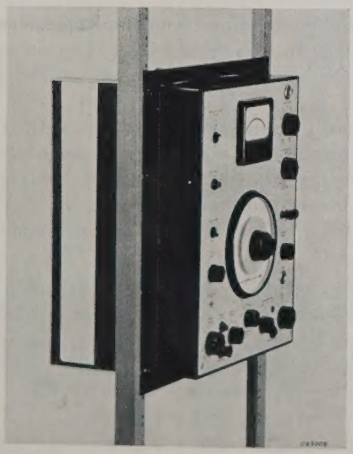
Fig. 2.

Type B.
Similar to Type A, but the instrument and the metal case are housed in a mahogany cabinet with cover. In this cabinet it is easy to transport the instrument.*)

Type C.
Similar to Type A, but fitted with a frame suitable for mounting the instrument into a 19″ standard rack.
A chain-wheel will be delivered together with the frame if necessary for operation when the instrument is rack mounted. The chain and the chain tightener is delivered with the Level Recorder Type 2305C.

*) To house Type A instruments in mahogany cabinets, remove the four threaded retainers, located at the back of the metal case, and the four rubber feet. Place the instrument and the metal case into the mahogany cabinet, and then replace the threaded retainers, and the rubber feet, (Fig. 2) which will now require the longer fixing screws, which are delivered with the mahogany cabinet.





b

Fig. 3. a: Assembly of the frame. b: The instrument mounted in the frame on 19" standard rack.

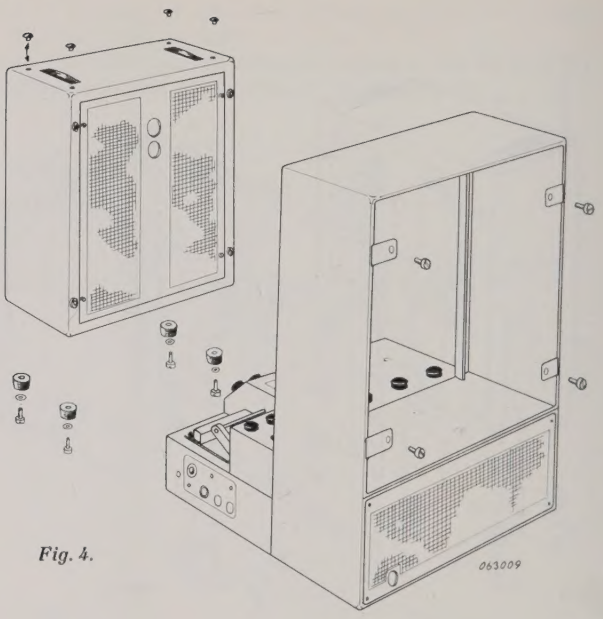


Fig. 4.

The method of assembling the frame and the instrument to a unit is shown in Fig. 3. After removing the four rubber feet the instrument and metal case can be placed into the mounting frame and secured by the four screws supplied with Type C.

If a B & K combination mounting unit is to be used for housing the equipment, then the instrument in a metal case is placed into the combination unit, after first removing the rubber feet, and secured by the same four screws as for 19″ standard rack mounting (Fig. 4).

In the following a list is given of the B & K combination mounting units which can be delivered:

3306 = 1013A + 2305A + KC 3300
3307 = 1017A + 2305A + KC 3300
3308 = 1022A + 2305A + KC 3300
3309 = 1024A + 2305A + KC 3300
3314 = 2107A + 2305A + KC 3314
3315 = 2112A + 2305A + KC 3315
3328 = 1013A + 1017A + 2305A + KC 3328
3329 = 1022A + 2603A + 2305A + KC 3329
3331 = 1022A + 2107A + 2305A + KC 3331

3332 = 1022A + 2112A + 2305A + KC 3332
3333 = 1612A + 2107A + 2305A + KC 3333
3334 = 1024A + 2603A + 2305A + KC 3329
3335 = 1024A + 2112A + 2305A + KC 3332
3336 = 7001A + 2305A + KC 3300
3337 = 7001A + 2603A + 2305A + KC 3329
3338 = 7001A + 2107A + 2305A + KC 3331
3339 = 7001A + 2112A + 2305A + KC 3332

and the type Nos. stand for:

1013 Beat Frequency Oscillator
1017 Beat Frequency Oscillator
1022 Beat Frequency Oscillator
1024 Sine-Random Generator
1612 Band-Pass Filter Set
2107 Audio Frequency Analyzer
2112 Audio Frequency Spectrometer
2305 Level Recorder
2603 Microphone Amplifier
700[illegible] Tape Recorder

KC is the used steel cabinet.

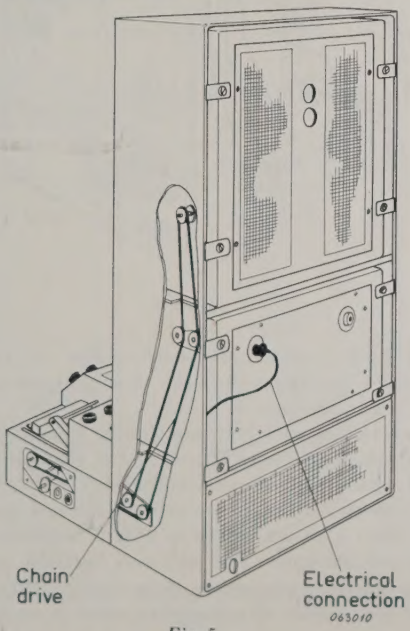


Fig. 5.

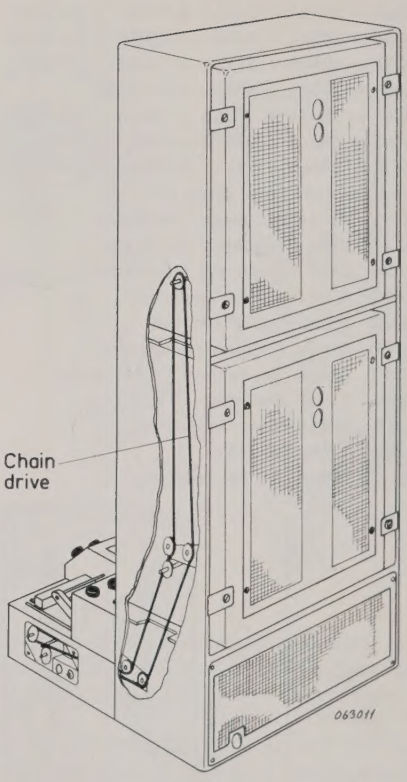


Fig. 6.

To assemble the B & K combination mounting unit, the chain drive system, and the electrical connections between the instruments, the procedure described in the following must be used.

In example 1 instruments with both mechanical (chain-) and electrical connections as drive system are used (Fig. 5) and in example 2 two instruments with mechanical (chain-) drive system are used (Fig. 6).

In Fig. 7 a purely electrical connection between the instrument and the Level Recorder Type 2305 is shown, while in Fig. 8 a purely mechanical connection between one instrument and the Level Recorder is shown.

Fig. 27 shows the necessary connections to be made to DRIVE SHAFT II when the expansion or compression of a frequency curve is required.

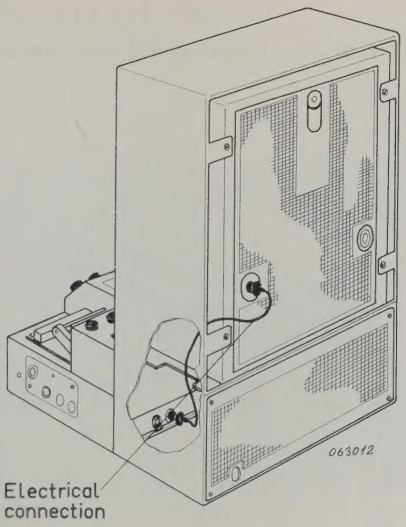


Fig. 7. Purely electrical connection between the instruments.

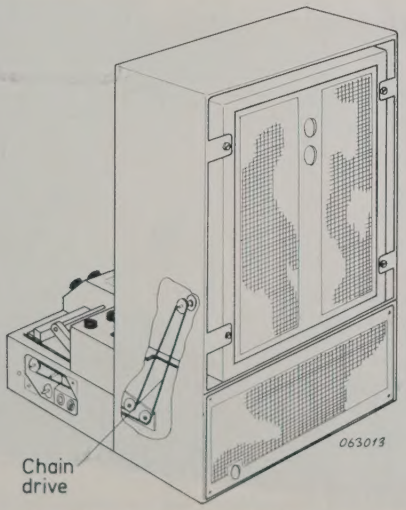


Fig. 8. Mechanical connection between one instrument and the Level Recorder Type 2305.

Example 1.

(Electrical and mechanical connections)

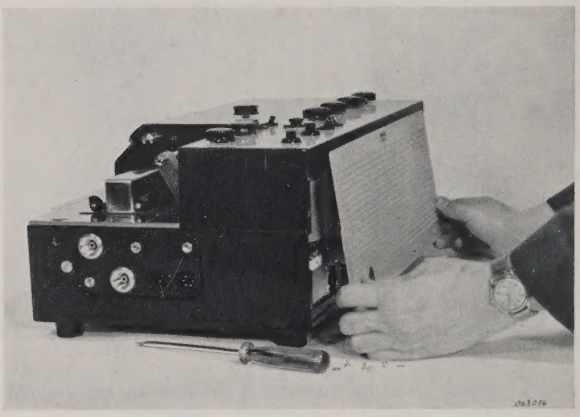


Fig. 9.

1. Remove the back cover of the Level Recorder Fig. 9.

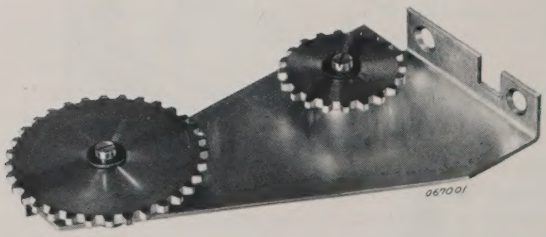


Fig. 10 a. Chain tightener.

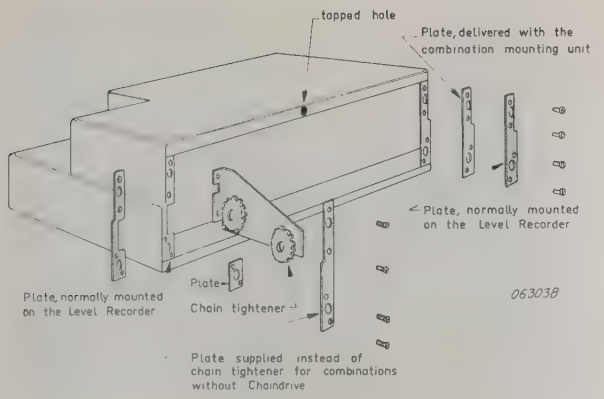

tapped hole
Plate, delivered with the combination mounting unit
Plate, normally mounted on the Level Recorder
Plate, normally mounted on the Level Recorder
Plate
Chain tightener
063038
Plate supplied instead of chain tightener for combinations without Chaindrive

Fig. 10 b.

2. Mount the chain tightener and the two plates onto the Level Recorder. Fig. 10 a-b.

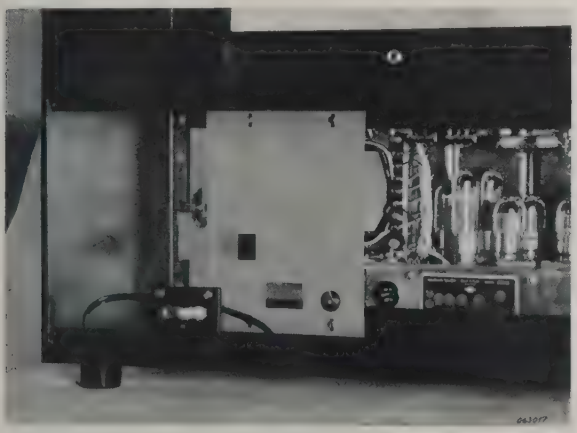
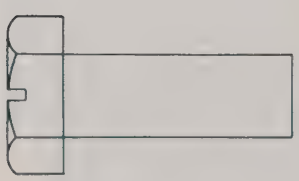


Fig. 11.

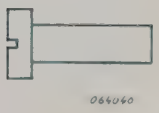
3 Mount the mu-metal plate on the combination mounting unit. Fig 11 This should only be done, when the Extension Filter Set ZS 0146 is used. See page 18.

Fig. 12.

4. Fasten the Level Recorder to the combination mounting unit with four HEX/HD screws through the plates shown in Fig. 12 and one CH HD screw into the tapped hole shown in Fig. 10 b.



Hexagonal Head (HEX/HD) screw.



Cheese Head (CH/HD) screw.

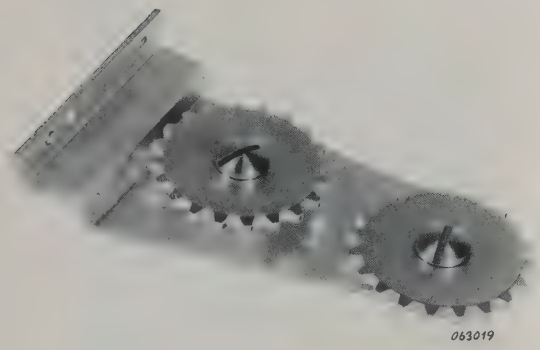


Fig. 13 a. Chain wheels.

Fig. 13 b.

5. Screw the chain wheels onto the combination mounting unit. Fig. 13 a-b

Fig. 14.

6. Place the instruments into the mounting unit. Fig. 14.

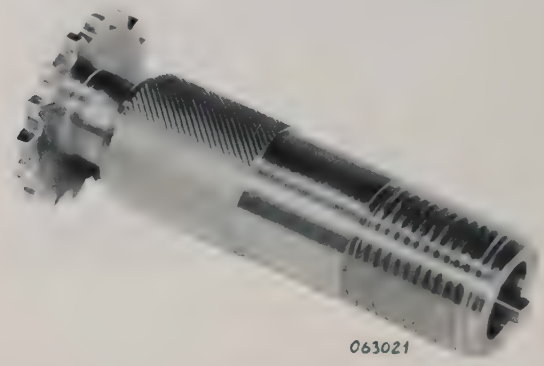


Fig. 15 a.

Fig. 15 b.

7. Screw the chain wheel onto the instrument. Fig. 15 a-b.

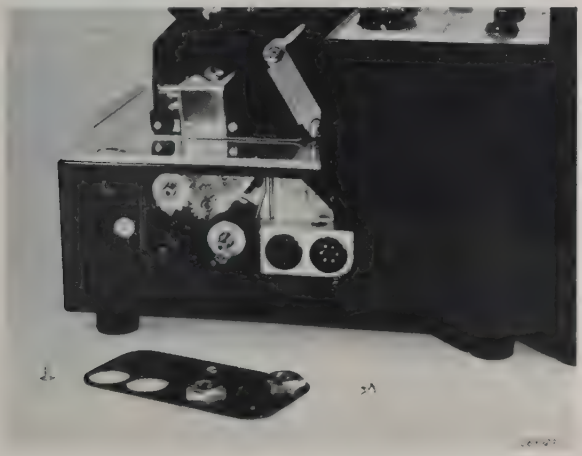


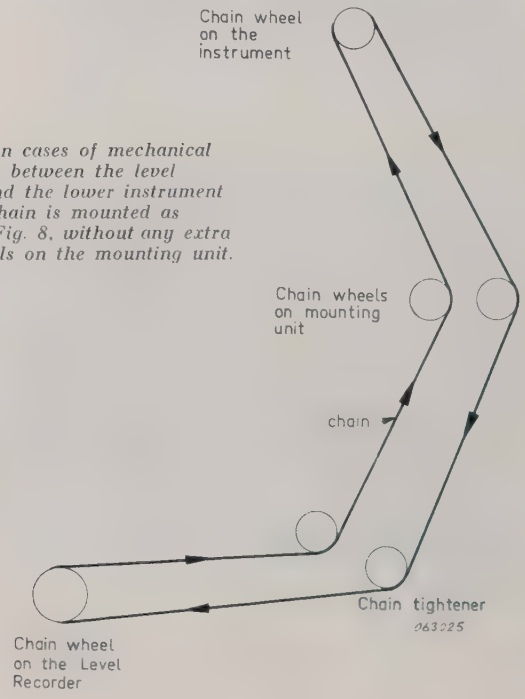
Fig. 16.

8. Remove the small cover on the right side of the Level Recorder. Fig. 16

Fig. 17.

9. Set PAPER SPEED between two positions. Fig. 17.

Fig. 18 a. In cases of mechanical connections between the level recorder and the lower instrument only, the chain is mounted as shown in Fig. 8, without any extra chain wheels on the mounting unit.



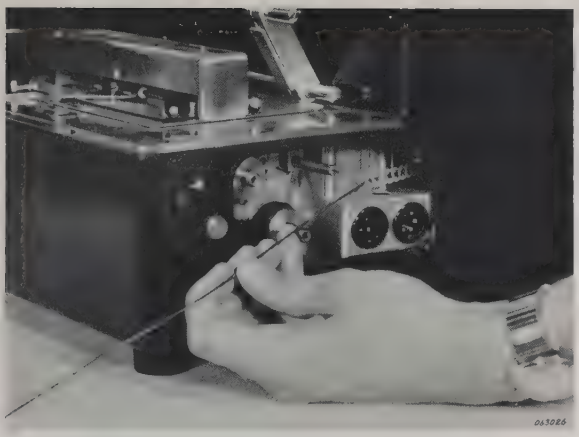


Fig. 18 b.

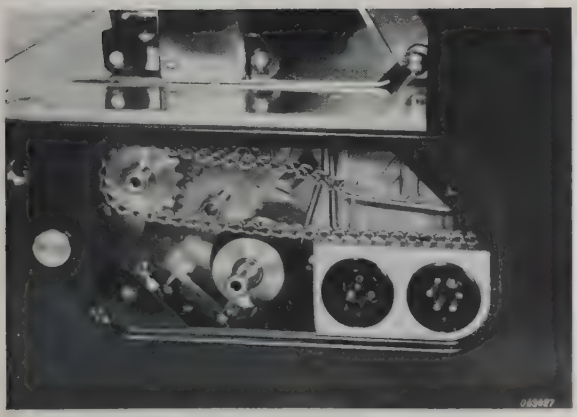


Fig. 18 c.

10. Fit the chain as in Fig. 18 b-c, following the direction of the arrows (see Fig. 18 a).

Fig. 19 a.

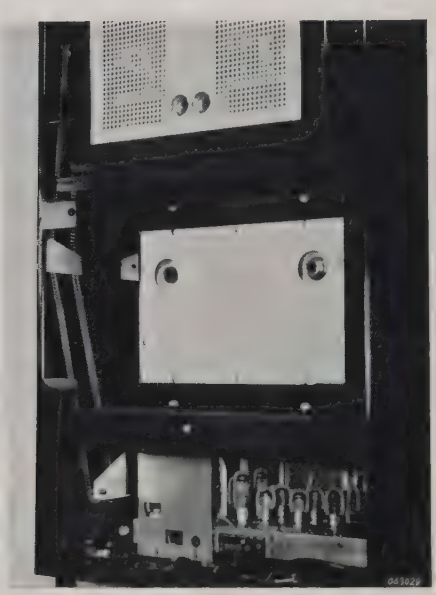


Fig.19 b.

11. Cut the chain to the correct length and join the two ends together. Adjust the chain tightener.*) Fig. 19 a-b.

If necessary lubrication may be used for the chain wheels and the chain.

12. Connect the power- and control leads. Fig. 20.

13. If desired, place the Extension Filter Set ZS 0146 into the mounting unit, and connect the cable to the instrument. Fig. 21.

The Extension Filter Set ZS 0146 is mounted by means of 4 fixing screws through the bottom of the combined unit. The fixing screws are the same as used for the crating of the filter set for transport.

14. Screw the back cover of the Level Recorder onto the combination mounting unit. Fig. 22.

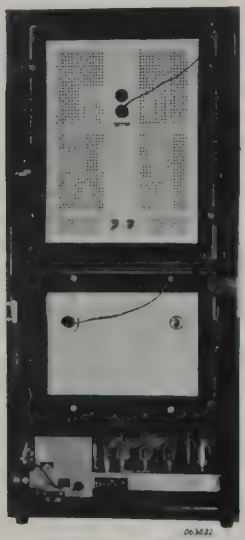


Fig. 20.

*) Loosen the black knob on the chain tightener, and adjust the tension of the chain, and then tighten the black knob again.

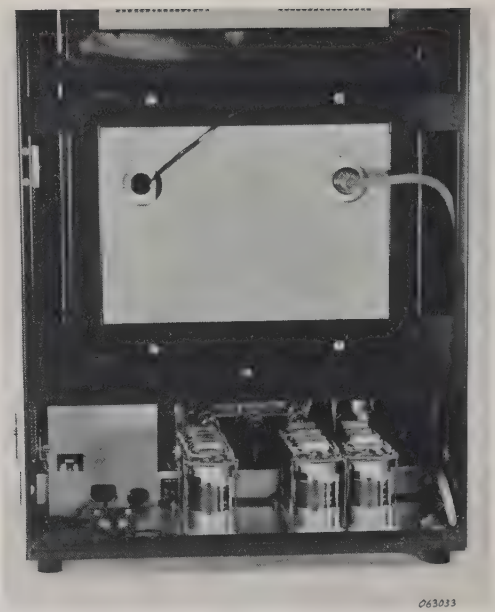


Fig. 21.

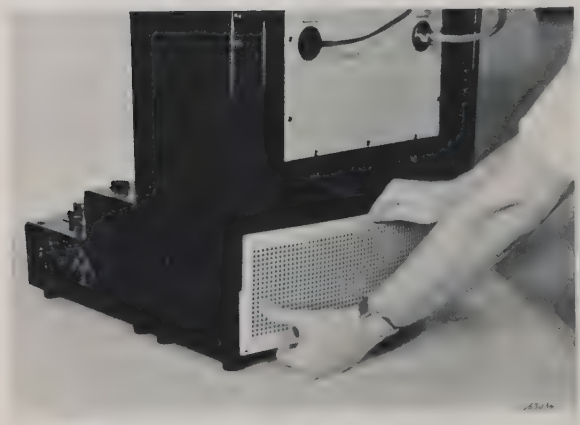


Fig. 22.

Example 2.

(Mechanical connections)

1. Remove the back cover of the Level Recorder. Fig. 9.
2. Mount the chain tightener onto the Level Recorder. Fig. 10 a-b.
3. Mount the mu-metal plate on the combination mounting unit. Fig. 11.
4. Fasten the Level Recorder to the combination mounting unit. Fig. 12.
5. Screw the chain wheels onto the combination mounting unit .Fig. 13 a-b.
6. Place the instruments into the mounting unit. Fig. 23.

Fig. 23.

7. Screw the chain wheel to the instrument. Fig. 15 a-b.
8. Remove the small cover on the right side of the Level Recorder. Fig. 16
9. Set PAPER SPEED between two positions. Fig. 17.
10. Fit the chain as in Fig. 18 b-c. Following the direction of the arrow (Fig. 24).
11. Cut the chain to the correct length and join the two ends together. Adjust the chain tightener.*) Fig. 18 a

* See footnote page 14.

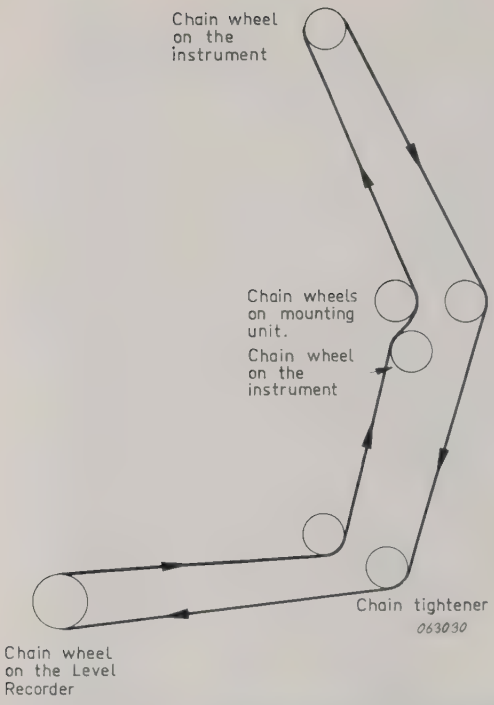


Fig. 24. In cases of mechanical connections between the level recorder and the lower instrument only, the chain is mounted as shown in Fig. 8, without any extra chain wheels on the mounting unit.

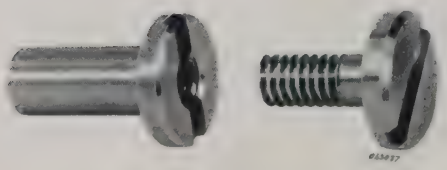


Fig. 25. Threaded retainer and screw.

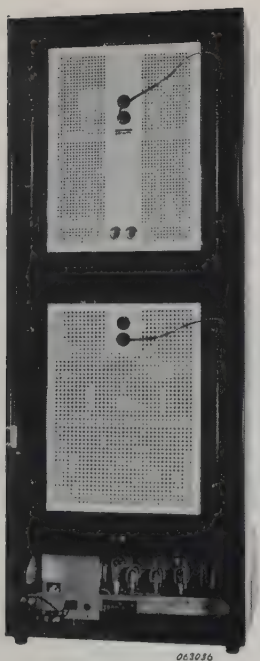


Fig. 26.

12. Connect the power- and control leads. Fig. 26.
13. Screw the back cover of the Level Recorder onto the combination mounting unit. Fig. 22.

Doubling of Frequency Scale.

A special recording paper QP 1142 with an expanded frequency scale, covering the frequencies 100—10000 Hz is produced and may be used with the combination units in addition to the other paper types.

The pre-printed frequency scale on this paper is doubled, so that the speed of the Level Recorder paper drive must be doubled relative to the scanning speed of the Oscillator. This is done by interchanging the large wheel on the chain tightener (Fig. 10a) with the wheel on the part screwing into the Oscillator (Fig. 15a). In the case of the Audio Frequency Spectrometer Type 2112 and the Band Pass Filter Set Type 1612 a realy device ZH 0006 is connected in the

control circuit, halving the number of pulses from the Level Recorder to the filter drive mechanism.

Expansion and Compression of Recorded Curves.

In the previous examples the chain wheel attached to DRIVE SHAFT I on the Level Recorder has been used to effect the drive to the other instruments in the combination unit. This giving a synchronized drive speed between the recording paper on the Level Recorder and the frequency scanning of the combined instrument. However, should it be found advantageous to expand or compress a frequency record, then DRIVE SHAFT II should be utilized. This gives the possibility of varying the relative speed between the paper drive and the chain drive.

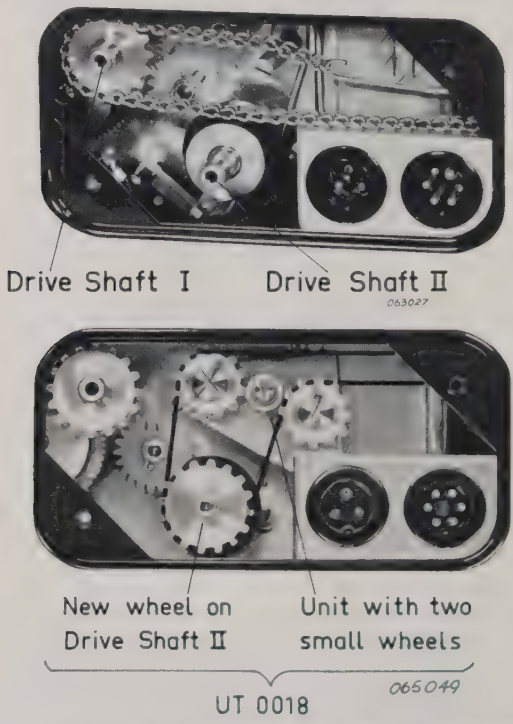
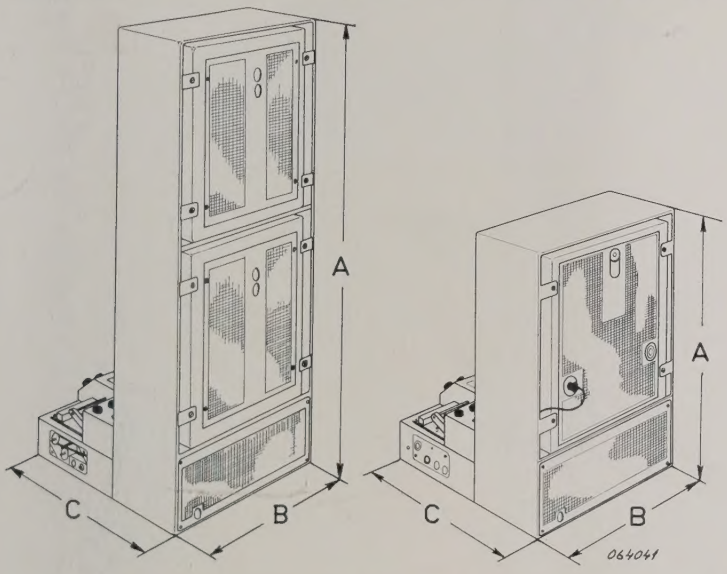


Fig. 27. Connection of chain wheels and chain to DRIVE SHAFT II.

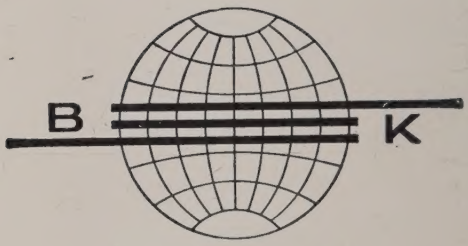
To make the appropriate connections to DRIVE SHAFT II refer to Fig. 27 and proceed as follows:

1. Screw off the wheel holding the cam discs and screw on the new chain wheel.
2. Push the unit UT 0018 with the two small chain wheels onto the Out-In Control for the Two Channel Selector.
3. Fit the chain as shown in Fig. 27.

Dimensions of the B & K combination mounting units which can be delivered.



Combination Type no.	A mm	B mm	C mm
3306-07-08 3309-14-15 3336	728	484	493
3328-3331-32-35-39	1240	484	493
3329-3334-37	1139	484	493
3333	1039	484	493



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